# *Center for Exoplanet Science Colloquium Series*

**Date & Time:** **Thursday, 5 June 2008 at 4:00 p.m.**
Coffee & Cookies at 3:45 p.m.

**Place:** **JPL building 169-336**

**Speaker:** **Christian Marois, Herzberg Institute of Astrophysics, BC, Canada**

**Title:** **Direct Exoplanet Detection with Ground-Based Telescopes**

**Abstract:** **The first unambiguous detection in 1995 of a substellar object in orbit around a star, Gl229b, was the only successful direct imaging discovery during a period of several years, in spite of numerous attempts by other groups. These early surveys were mostly sensitive to brown dwarfs, but now, using more advanced adaptive optics systems, optimized acquisition strategies, and data reduction schemes, surveys are now reaching the planet regime. The first statistical analyses of the exoplanet population at wide (>30AU) separations are now being compiled. Such analysis is fundamental to constrain the planet formation mechanism in the outskirts of circumstellar disks. I will first discuss our latest nearby/young 80-star adaptive optics imaging survey result obtained at the Gemini telescope with Altair/NIRI using the very successful angular differential imaging technique. I will also present our second-generation ongoing international survey to acquire higher-mass stars and explore possible biases. Although these surveys have currently achieved one of the best on-sky contrast curves to date, they are still limited at small angular separations by a quasi-static speckle noise and by varying observing conditions. I will briefly describe the current effort by our group to design and build a high-order adaptive optics system to reach 10-7 contrast at a few lambda/D. Such system will have the sensitivity to directly detect for the first time young (~100 Myr) Jovian-like planets in orbits similar to the ones of our solar system. This instrument, called the Gemini Planet Imager, is scheduled for first light at Gemini south in 2010.**